IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

ON SEMICONDUCTOR CORPORATION, and SEMICONDUCTOR COMPONENTS INDUSTRIES, LLC;

Plaintiffs,

v.

POWER INTEGRATIONS, INC.

Defendant.

C.A. No. 17-247-LPS-CJB

POWER INTEGRATIONS' OPENING CLAIM CONSTRUCTION BRIEF

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TABLE OF CONTENTS

TABLE OF AUTHORITIES

Page(s)

Cases

I. INTRODUCTION

This case involves over a dozen patents, half asserted by ON Semiconductor Corporation and Semiconductor Components Industries, LLC (collectively, "ON") and half by Power Integrations, Inc. ("PI"). Although the patents all pertain to power supply controllers generally, the claim construction issues across these patents are numerous and disparate. The disputes themselves, however, are fairly straightforward—a product of ON's transparent attempt to craft invalidity and infringement positions divorced from the plain meaning of the claim terms and the intrinsic record. While the parties have focused on fifteen of the disputed terms, the briefed issues necessarily implicate, and will likely resolve, many of the parties' other disputes as well.

II. NATURE AND STAGE OF THE PROCEEDINGS

After initially suing PI in the Eastern District of Texas, ON filed the instant lawsuit in substantially identical form on March 9, 2017, alleging infringement of U.S. Patent Nos. 7,440,298 ("the '298 patent"); 7,564,705 ("the '705 patent"); 9,077,258 ("the '258 patent"); 7,796,407 ("the '407 patent"); 7,800,923 ("the '923 patent"); and 7,102,211 ("the '211 patent"). [D.I. 1.] ON subsequently filed an amended complaint asserting the same patents on September 8, 2017 [D.I. 24], which PI answered, and filed a counterclaim on September 29, 2017, alleging infringement of U.S. Patent Nos. 6,249,876 ("the '876 patent"); 6,107,851 ("the '851 patent"); 6,229,366 ("the '366 patent"); 6,337,788 ("the '788 patent"); 6,456,475 ("the '475 patent"); 8,077,483 ("the '483 patent"); and 8,773,871 ("the '871 patent"). [D.I. 34.]

The asserted PI patents are directed to pioneering innovations in power supply controller design. That these PI inventions were not only revolutionary, but also widely used and repeatedly infringed by ON's subsidiary, Fairchild, has in large part been established in other litigation. The asserted '876, '851, and '366 patents in particular have a long history in this Court and, as a result, some of the briefed terms have previously been construed. The other

asserted PI patents have not been previously litigated.[1] The asserted ON patents come from its acquired portfolio. Five of the six patents come from System General founder Tom Yang by way of Fairchild. Like prior Yang patents asserted in other cases, each of the purported Yang inventions describes specific circuit configurations (here, alleged improvements on a well-known technique called synchronous rectification) not adopted by the industry at large, and least of all by PI. The ’211 patent was acquired by ON from Sanyo and is directed towards techniques for dissipating heat from the integrated circuit. None of these ON patents was previously litigated.

The parties have exchanged thousands of pages of core technical documents, preliminary infringement and invalidity contentions, and are conducting fact discovery, which is scheduled to close on December 5, 2018. The parties made their Joint Submission of Proposed Claim Terms on March 28, [D.I. 67], and submitted an amended version on May 22, 2018. [D.I. 78.] As noted above, in an attempt to most effectively assist the Court in resolving the core disputes, and in accord with the Court’s instructions, the parties have agreed to focus on a subset of fifteen disputed terms.[2]

III. STANDARDS FOR CLAIM CONSTRUCTION

Claim construction is an issue of law for the Court. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970–71 (Fed Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). Thus, it is the role of the court to resolve disputes regarding the scope of the asserted claims. *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1360 (Fed. Cir. 2008). Ultimately, “the

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[1] The’851 patent is at issue in C.A. No. 04-1371-LPS (“*Fairchild I*”) and C.A. No. 08-309-LPS (“*Fairchild II*”). The ’366 patent is at issue in *Fairchild I* and C.A. No. 12-540-LPS (“*Fairchild VI*”). The related ’876 patent also has a long history in this Court, however, it remains subject to protracted motions practice to determine where PI’s claims against ON will proceed. Neither party has proposed constructions with respect to PI’s asserted ’483 and ’871 patents.

[2] All numbered exhibits are attached to the contemporaneously filed Declaration of Warren K. Mabey, Jr. Ex. 1 contains a chart of the parties’ competing constructions for these fifteen terms.

court's obligation is to ensure that questions of the scope of the patent claims are not left to the jury." *Every Penny Counts, Inc. v. Am. Express Co.*, 563 F.3d 1378, 1383 (Fed. Cir. 2009). Because this Court is familiar with the applicable canons of claim construction, PI will not reiterate those principles except where relevant to specific disputed issues, as noted below.

IV. THE POWER INTEGRATIONS PATENTS-IN-SUIT

The asserted PI patents all relate to technologies for power supply controllers, invented by PI and implemented in its highly successful controller ICs. The '851 and '366 patents relate to two such features, referred to as integrated frequency jitter and integrated soft-start. The '788 and '475 patents both relate to fault protection in the context of "on/off control" regulation—another pioneering technology introduced by PI with its TinySwitch line of devices.

A. The '851 and '366 patents – integrated frequency jitter and soft start

As the Court will recall, the common specification of the '851 and '366 patents describes two problems of traditional power supply controllers. One is electromagnetic interference ("EMI") caused by high frequency switching. [D.I. 67-1, Ex. H, 1:22–65.] Another is "in rush" current at startup that can damage circuit components. [*Id.* at 1:66–2:26.] The specification describes solutions to both of these problems in the form of integrated circuitry to accomplish both tasks *inside* the same controller chip. [*Id.* at 3:40–4:30.]

The term "frequency jittering" means varying the switching frequency of a switch mode power supply about a target frequency in order to reduce EMI. [*See Fairchild I*, D.I. 231 at 17 and D.I. 232 at ¶ 8; *Fairchild II*, D.I 212 at 33–36 and D.I. 337.] The '851 patent performs this frequency jittering using a frequency variation circuit that generates a "frequency variation signal," which the parties have agreed should have the previous construction of "an internal signal that cyclically varies in magnitude during a fixed period of time and is used to modulate

the frequency of the oscillation signal within a predetermined frequency range." [*See Fairchild I*, D.I. 231 at 34–37 and D.I. 232 at ¶¶ 15–16; *Fairchild II*, D.I. 212 at 28–32 and D.I. 337.]

The claimed integrated soft start circuit combats the in rush problem by controlling the duty cycle of the main switch during startup and gradually increasing the on-time over the course of the startup phase. [*See* D.I. 67-1, Ex. H, 5:66–6:9; 6:39–65.] It does so by comparing a slowing rising soft start signal (such as an analog ramp signal) with a signal representing the switch on-time (such as a saw tooth signal from a PWM oscillator) within the controller, and generating an output signal to control the switch. [*Id.* at 6:66–7:8; Figs. 3, 4.] As the soft start signal increases over time, the switch on-time similarly increases and, ultimately, the soft start period ends and the feedback loop takes over regulating the output normally. [*Id.*]

Although potentially integrated into the same preferred controller embodiment, both inventions are independent. Thus, while the disclosed embodiments contemplate some interaction between circuits, the claimed jitter circuit does not require soft start functionality to operate, nor does the soft start invention require jitter functionality.

1. "internally controlled signal within the regulation circuit" ('851 patent)

The phrase "internally controlled signal within the regulation circuit" requires no construction beyond its plain and ordinary meaning. ON's proposed construction seeks to import an unfounded limitation from the specification that stems from an aspirational, but not necessary, characteristic of internally controlled signals.

The agreed-to prior construction of "frequency variation signal"—"an ***internal*** signal that cyclically varies in magnitude during a fixed period of time and is used to modulate the frequency of the oscillation signal within a predetermined frequency range"—sufficiently defines the important characteristics of the signal. The inclusion of "internal" accords with the purpose of the '851 patent, which was to avoid various potential problems with the prior art (that used

external components and externally controlled frequency variation methods) by implementing a technique that was internally controlled.

ON now contends that "internally controlled" should be understood to mean something narrower than the common meaning of the words. Specifically, ON draws its proposal from the following passage in the specification touting the benefits of the inventive frequency jitter technology: "This has an advantage over the frequency jitter operation of FIG. 1 [the prior art] in that the frequency range of the presently regulation circuit 850 is known and fixed, and is not subject to the line voltage or load magnitude variations." [D.I. 67-1, Ex. H, 11:46–49; *see also* 6:14–18.] But this is an aspirational goal of the invention and, at best, a non-exhaustive list of characteristics which may result from implementing the invention; it is not definitional and does not explain or limit the meaning of "internally controlled." *See, e.g.*, *Intel Corp. v. ITC,* 946 F.2d 821, 836 (Fed. Cir. 1991) (noting goals of the invention are not to be imported into the claims). ON's proposal should therefore be rejected.

2. "according to a magnitude of said frequency variation signal" ('851 patent)

As with the previous term, and for the same reasons discussed above, ON's proposed construction is both unhelpful (because it fails to define the term) and improper (because it injects a limitation that is contrary to the claim language and the written description).

The claim language itself nowhere suggests that "according to a magnitude of said frequency variation signal" means the signal is "not subject to line voltage or load magnitude variations." Moreover, for the reasons discussed above, the specification's touted, and non-exhaustive, list of benefits owing to the use of an internally controlled frequency variation signal does not limit the definition of the frequency variation signal (any more than the Court has previously determined in construing this term). Thus, the Court should reject ON's attempt to import extraneous limitations into the claims. Here, the meaning of "according to a magnitude

of" is clear: the signal instructing said drive circuit to discontinue said drive signal is derived, at least in part, from the magnitude of the frequency variation signal. [*See* D.I. 67-1, Ex. H, 8:60–9:27.]

3. "a maximum duty cycle signal comprising an on-state and an off-state" ('366 patent)

The parties agree that a maximum duty cycle signal is a signal for limiting the maximum "on-time" of a power switch during an on/off switching cycle. The remainder of ON's proposal is both incorrect and incomplete in that it conflates the "on-state" and "off-state" of the maximum duty cycle signal with the respective on and off states of the switch it controls. The written description provides that the "on-state" / "off-state" of the maximum duty cycle signal allows the switch to be active or "on" / inactive or "off" and is independent of the logic state (*i.e.* active high or active low level) used to implement the maximum duty cycle functionality of the signal. [*See, e.g.*, D.I. 67-1, Ex. I, 9:6–13; 12:5–10 (explaining the independence of the on-time of the power switch and maximum duty cycle on-time).] There is nothing in the specification or prosecution history (neither original nor reexamination) that ties the signal's specific logic state to the claimed "on-state" and "off-state" and, therefore, ON's construction should be rejected.

4. "soft start circuit means" ('366 patent)

The '366 patent describes and claims new circuit structures that allow the soft start functionality to be fully integrated into a power supply controller chip, without the need for any external components, in a manner that improves the predictability and controllability of the soft start operation over the prior art methods. The Court previously construed the disputed post-reexamination "soft start circuit means" as a means-plus-function element with a function corresponding to the plain meaning and a structure shown in Figures 3, 6, and 9 and described in 6:7–17, 6:35–7:18, 11:40–50, 12:5–10. [*Fairchild VI*, D.I. 87 at 14-16 and D.I. 88 at ¶ 7.] Here

the parties generally agree. The dispute lies in ON's attempt to further narrow the claim to require additional limitations—imported from the jitter invention also present in the preferred embodiments—that are not part of the structure necessary to perform the soft start function.

Construing a means-plus-function claim is a two-step process. "First, the court must determine the claimed function. Second, the court must identify the corresponding structure in the written description of the patent that performs that function." *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed. Cir. 2012). When determining corresponding structures, the Court must determine if the intrinsic record "clearly links or associates that structure to the function recited in the claim." *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997). Here, nowhere in the aforementioned passages and figures describing the soft start circuit means does the '366 patent *require* a signal having all of the limitations of the construed "frequency variation signal" to accomplish the recited soft start function of disabling the drive signal during at least a portion of the maximum time period/on-state of said maximum duty cycle. Although one embodiment in the specification shows that "a frequency variation signal 400 is provided to soft start circuit 410," [D.I. 67-1, Ex. I, 6:49–52], the purpose of that signal is to provide a signal with a slowly varying magnitude during a soft start period that limits the switch on-time. [*Id.* at 6:35–51; Fig. 4.] In a controller that does not also employ frequency jitter, any slowly varying signal may be used instead of the frequency variation signal used in the combined jitter/soft-start embodiments—for example, a ramp signal, counter output signal, or any other signal that slowly varies in magnitude over the soft start time. [*Id.*] As explained by the specification, the portion of the corresponding structure shown in Figure 3 that is used to perform the soft-start function is a ramp generator, generating the first ramp of signal 400; it does not include the remaining

components needed to make the signal repeat for the purpose of frequency jitter. [*See id.* at 7:6–8, 8:50–55, Fig. 3.] Thus, ON's proposal imports extraneous structure and should be rejected.[3]

B. The '788 and '475 patents – on/off control

The '788 patent and its continuation, the '475 patent, both relate to power supply control systems with fault condition protection. [*See, e.g.*, D.I. 67-1, Ex. J, 1:46–56.] The claimed inventions of both patents monitor a feedback signal to detect whether the power supply is experiencing a fault, *e.g.*, is short circuited, overloaded at the output or has encountered an open loop condition. [*Id.* at 1:23–33.] If any of these faults is present, the regulator goes into a protective mode where it periodically delivers power for only a brief period and, if the fault persists, turns off the power supply for another, longer, time period. [*Id.* at 1:33–42.] If the fault is removed, the power supply automatically restarts and operates normally. [*Id.* at 1:42–43.]

The unique characteristics of the claimed "feedback signal" make the disclosed fault protection both possible and highly efficient. Unlike prior art analog feedback signals that track the actual magnitude of the output, the feedback signal driving the invention periodically transitions between a low state and a high state to provide output information. [*See, e.g.*, *id.* at 5:25–27.] In other words, the claimed inventions employ a technique invented by PI that became known as "on/off" control (although the original patents referred to it as "digital" control).

1. "the feedback signal cycling [periodically] between a first state and a second state when the power supply operates normally" ('788 and '475 patents)

It is fundamental to the operation of the inventions disclosed in the '788 and '475 patents that the feedback signal cycles between discrete first and second states. In other words, the feedback signal is "digital" in nature and does not continuously vary in an analog fashion. ON's

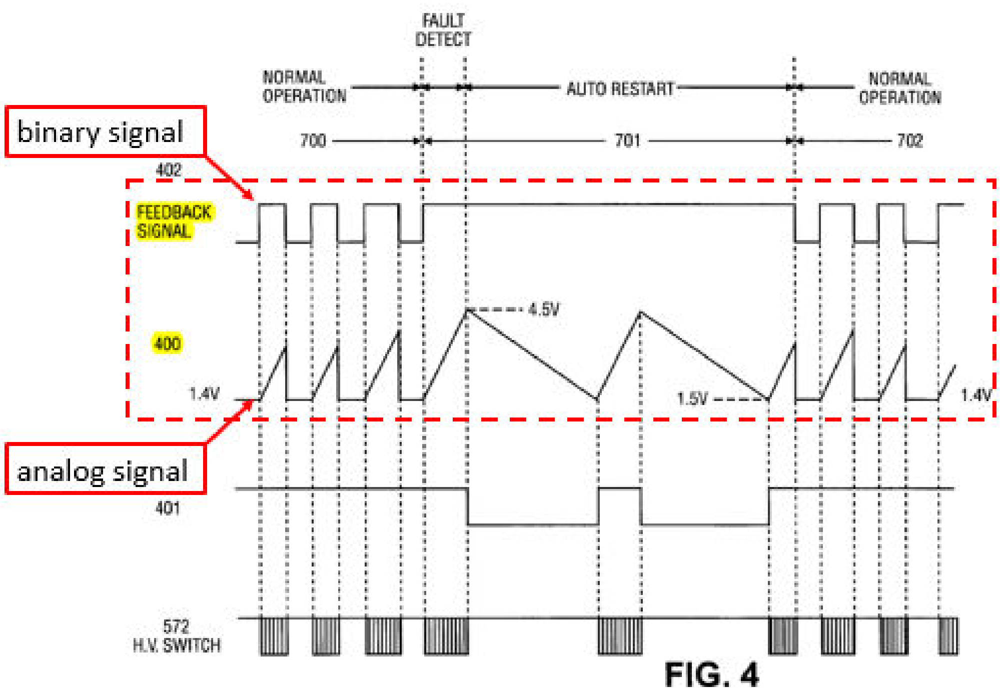
[3] To be clear, PI preserves its objection to the Court's prior determination in previous litigation that the frequency variations signal is itself a limitation to the claimed soft start circuit means. *See Fairchild VI*, D.I. 338 at 6–7.

proposed construction, though seemingly innocuous, is vague and would appear to encompass analog feedback signals that continuously vary in amplitude along with the changing output voltage; *i.e.* signals that do not convey the characteristic on/off feedback information.

Implicit in the claims' mandate that the signal cycles *between* a first state and a second state is that the signal cycles from one discrete state to a second discrete state and back again. The patents' common disclosure explains that "[d]uring operation, the feedback signal periodically pulses between a low state and a high state depending on the amount of power required on a secondary winding." [D.I. 67-1, Ex. J, 1:46–56.] To *pulse* between states has both a common meaning and specific meaning that is well known to those in the art. And under any meaning, to "pulse" connotes a sudden change in state, not gradually varying over time. [*See, e.g.*, Ex. 2, MCGRAW-HILL ELECTRONICS DICTIONARY 360 (6th ed. 1997) ("A momentary, sharp change in a current, voltage, or other quantity that is normally constant."); Ex. 3, MODERN DICTIONARY OF ELECTRONICS 597 (7th ed. 1999) (accord); Ex. 4, DICTIONARY OF IEEE STANDARDS TERMS 886 (7th ed. 2000) (accord); *see also* discussion *infra* re pulse signals.]

Moreover, in both the embodiment shown in Figure 1 (using a digital timer implemented with a counter) and the circuit of Figure 3 (using an analog timer implemented using a capacitive circuit), the feedback signal conveys the same "binary" (*i.e.* high/low or on/off) information. The periodic cycling of the feedback signal between discrete states indicates that no fault is present in the power supply. [*See* D.I. 67-1, Ex. J, 4:45–55, 5:25–35, 5:54–59 (discussing Fig. 1); 6:15–54 (discussing Fig 3).] However, in the event of a fault condition, the feedback signal remains in a single state (the second (high) state in the example) for a predetermined time. [*Id.* at 4:55–60, 5:35–53, 5:60–6:2; 6:15–7:6.] Thus, it is the ability to quickly and easily discern which state the feedback signal is in (low/high; on/off) that the claimed invention exploits.

Figures 2 and 4, common to both specifications, further demonstrate that the feedback signal cycles only between two distinct states. Figure 2 shows a plot illustrating the operation of the Figure 1 circuit, whereas Figure 4 illustrates the operation of the Figure 3 circuit. In both, the FEEDBACK SIGNAL is shown to cycle between two discrete states. Contrast for example in Figure 4, below, the binary feedback signal with the analog 400 signal (showing the continuously varying analog voltage generated by a periodically charging and discharging capacitor):



[*Id.* at Fig. 4 (annotated).]

This term should accordingly be construed to mean "the feedback signal cycles between discrete first and second logic states; i.e. does not continuously vary in an analog fashion."

2. "a timer" ('788 patent)

A timer is a well-known and ubiquitous term that does not require construction beyond its plain and ordinary meaning. ON's proposed construction seeks to import an unfounded limitation into the term—namely, the notion that a capacitor alone (or some other *circuit element*) can function as a timer. As discussed above, a counter may be used in some

embodiments or a capacitor used in other embodiments *as part of* implementing a timer; that is undisputed. However, these components *alone* are not coextensive with a timer. But for the need to clarify that a timer is not limited as ON argues, the meaning of this term is self-evident.

ON's proposed construction appears to be drawn from a misapprehension of the specification's "summary" of the invention section. The '788 patent explains that the fault protection circuit includes "a timer coupled to the switching device and to the feedback signal." [*See* D.I. 67-1, Ex. J, 1:53–55.] The purpose of the timer is to "disable[] the switching device to prevent power delivery to the output in a first predetermined period after the fault condition exists." [*Id.* at 1:54–56.] In summarizing the invention, the '788 patent states:

> The timer may be a digital counter. An oscillator with a predetermined frequency may be coupled to the counter. The oscillator may have a control input for changing the predetermined frequency and a first current source coupled to the oscillator control input to generate a first frequency. A second current source may be coupled to the oscillator control input to generate a second frequency. The counter's output may be coupled to the first and second current sources. The timer may be a capacitor which is adapted to be charged at a first rate from a first threshold to a second threshold to generate a first predetermined period. The capacitor may be discharged from the second threshold to the first threshold at a second rate to generate the second predetermined period. The capacitor may also be reset to a voltage below the first threshold each time the feedback signal cycles.

[*Id.* at 1:65–2:12.] From this summary, ON cherry-picks two sentences, without the context of the larger paragraph (or the detailed discussion of the embodiments further below), to suggest that the capacitor or some other *circuit element* alone can be the claimed timer. The recited passage makes clear that regardless of the "digital" or "analog" design choice employed (*i.e.* implementing a timer using a counter or a capacitor periodically charged/discharged between threshold voltages), additional circuitry beyond just a counter or capacitor is required for an operational timer capable of satisfying the recited purpose. [*See id.* at Fig. 1 and 4:45–60, 5:25–42 (counter based timer); Fig. 3 and 6:15–7:6 (capacitor based timer).] Nowhere in this

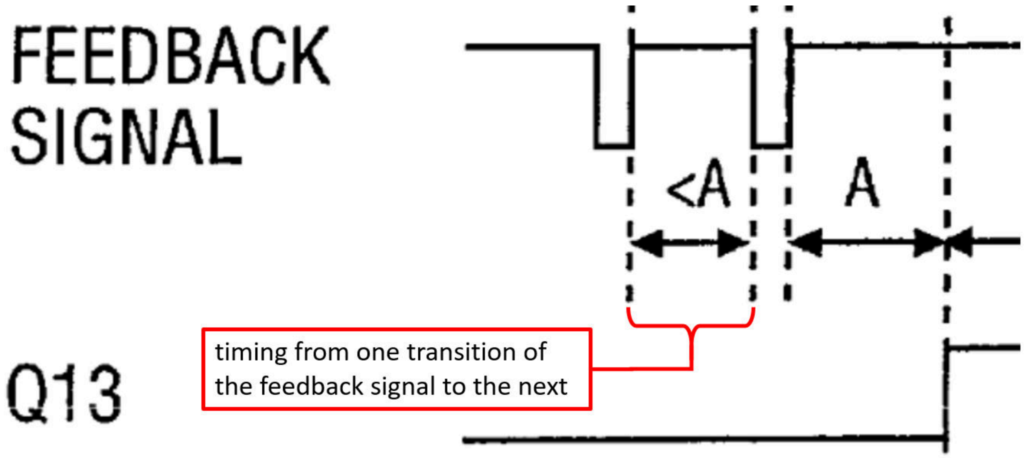
discussion or elsewhere does the patentee teach, or even suggest, that a single circuit element such as a capacitor could be used *in isolation* to generate a signal representative of elapsed time.

The dependent claims provide further clarification. While independent claim 1 recites "**a timer**" [*id.* at 7:51–60], it is agnostic to the timer's composition. Dependent claims 5 and 8, however, further recite "wherein the timer **includes a capacitor** . . . ," [*id.* at 8:3–7], and "wherein the timer **comprises a digital counter**," respectively. [*Id.* at 8:13–14.] The doctrine of claim differentiation, therefore, also provides a powerful argument against construing the term "a timer" restrictively, to specifically require the embodiments claimed in the dependent claims. *See InterDigital Comm'ns., LLC v. ITC*, 690 F.3d 1318, 1324–25 (Fed. Cir. 2012).

Accordingly, the Court should decline to construe "a timer" and afford the term its plain meaning. In the alternative, PI's proposed construction of "a circuit that measures elapsed time" is the appropriate construction consistent with the intrinsic evidence.

3. "timing the feedback signal" ('475 patent)

ON's proposed construction critically omits what aspect of the feedback signal is being timed. As discussed above, the claimed feedback signal is expected to continually cycle between two distinct states (*i.e.* transition from one state to the other and back again). When the feedback signal is cycling between its two states, the timer circuit permits the power supply to operate normally. [*See* D.I. 67-1, Ex. K, 1:53–58, 5:31–41, 5:60–65, 6:58–60, Figs. 2, 4.] When the feedback signal stops cycling (*e.g.*, remains at one state) for a predetermined period of time, the circuit disables the power supply's switching signal. [*See id.* at 1:53–63, 5:41–55, 5:66–6:8, 6:61–7:9, Figs. 2, 4.] Thus, the only relevant characteristic of the feedback signal that can be timed is the elapsed time from the last transition; *i.e.* the time between instances when the feedback signal changes its state. This timing of the feedback signal from its last transition is shown visually in Figure 2.



[*Id.* at Fig. 2 (excerpted and annotated).] Nothing else makes sense in the context of the disclosed and claimed invention. Accordingly, PI's proposed construction should be adopted.

V. THE ON PATENTS-IN-SUIT

The asserted ON patents collectively propose to solve perceived problems that could be, and in fact are, solved more effectively by other means. The accused PI products, as a result, look and operate nothing like the claimed inventions. ON's proposed constructions for its own patents impermissibly seek to recast the claims to cover the accused PI products, eschewing the written description of how the alleged inventions actually purport to do what is claimed.

A. The '298, '705, '407 and '923 patents – Yang synchronous rectification

The '298, '705,'407, and '923 Yang patents all relate to alleged improvements to a well-known technique in switching power supplies referred to as "synchronous rectification" (abbreviated as "SR"), where passive rectifying diodes on the output side of the power supply are replaced with actively controlled transistor switches. To work properly, the rectifying switch must be turned on and off at appropriate times in relation to the main switching transistor; in other words, the rectifier switch must be synchronized with the switching waveform generated at the output side of the energy transfer device. There were many techniques in the prior art to accomplish synchronous rectification and a number of commercial SR products on the market.

According to Mr. Yang, these solutions had problems, stemming from the use of output current sensing, phase-lock circuits, or other circuitry.

Each of the asserted Yang SR patents purports to address these issues by measuring circuit parameters (other than output current) available on the output side of the energy transfer device and using this measured data to control the rectifying switch. The ’298 and ’705 patents recite generating a control signal to drive the synchronous switch from these measured circuit variables. The ’407 and ’923 patents recite variations of the same basic theme.

1. “generat(e/ing) a [] signal . . . in response to” (’298, ’705, ’407, ’923 patents)

A primary dispute between PI and ON regarding all of the Yang SR patents is that ON has, across the board, attempted to dismantle the causal relationships that exists between the various claim elements that define the purported inventions. While the asserted claims use varying terms to describe this causal relationship—*i.e.* generating signal A “in response to” signal B; that signal A “is correlated to” signal B; and generating signal A “in accordance with” signal B—the intended meaning is invariably the same: the value (magnitude, duration, etc.) of signal A is derived, at least in part, from the value of signal B. For all of these related terms, based on its proposed constructions and its infringement contentions, ON seemingly contends that so long as signal B has some tenuous connection to the mere existence of signal A, the claim term is satisfied. The dispute regarding the term “generat(e/ing) a [] signal. . . in response to,” therefore, is exemplary. ON’s proposal that the plain meaning should prevail fails to acknowledge that, in the context of these patents, these phrases have a specific and well-defined meaning.

Claims 1 and 8 of the ’298 patent recite generating a control signal *in response to* three variables: a magnetized voltage, a demagnetized voltage, and a magnetization period of the claimed transformer or magnetic device. [D.I. 67-1, Ex. B, 6:31–34; 8:3–6.] Claim 1 of the ’705

patent similarly recites generating a control signal *in response to* both a magnetized voltage and a demagnetized voltage of the magnetic device. [D.I. 67-1, Ex. C, 6:45–47.] Claim 1 of the '407 patent recites generating a pulse signal and a synchronous signal *in response to* a feedback signal and also generating a switching signal in response to the synchronous signal [D.I. 67-1, Ex. E, 13:10–11, 16–18], whereas claim 31 recites the same limitations as claim 1 but adds that the pulse signal and synchronous signal are generated in response to a feedback signal *and* an oscillation signal. [*Id.* at 16:64–65, 17:1–2.] And claims 5 and 6 recite limiting the maximum duty of the switching signal *in response to* the synchronous signal and generating a current-sense signal *in response to* the switching current of the transformer, respectively. [*Id.* at 13:53–54, 57–58.] Last, claims 1 and 12 of the '923 patent recite generating pulse signals for controlling the synchronous switch *in response to* a switching signal and a feedback signal. [D.I. 67-1, Ex. D, 9:7–9; 10:52–54.] In each case, the meaningful characteristic of the first signal (*i.e.* its magnitude, duration, frequency) is derived from the measured characteristics of the second signal(s). Indeed, this relationship between the generated value of the output signal and the measured value of the input signal from which it is derived is at the very heart of each of the asserted Yang SR patents.

The specification of each patent makes clear the foundational premise on which each purported invention is based. Column after column of interrelated equations populate the specifications and explain the mathematical relationship between various circuit parameters, both constants known to the circuit designer (*e.g.*, the resistance or capacitance of certain components) and variables (*e.g.*, voltages or currents sensed at specific points in the circuit). [*See, e.g.*, D.I. 67-1, Ex. B, 1:21–46, 2:66–3:67, 5:1–59; D.I. 67-1, Ex. C, 1:29–54, 3:6–4:7, 5:7–6:6; D.I. 67-1, Ex. D, 6:43–7:6, 8:20–53; D.I. 67-1, Ex. E, 12:16–54.] And the fundamental

teaching of each patent is that, through these mathematical relationships, the circuit can calculate (rather than measure) the magnitude of the output current by plugging other measured values (*e.g.*, magnetized voltage and demagnetized voltage) into these equations. [*See, e.g.*, D.I. 67-1, Ex. B, 5:60–6:7; D.I. 67-1, Ex. C, 6:7–21; D.I. 67-1, Ex. D, 8:20–53; D.I. 67-1, Ex. E, 12:16–54.] With that calculated output current information, the patents contend that the circuit is able to provide a switching signal to the SR switch at the proper time during the cycle but without directly sensing the output current or the use of complex phase-lock loop circuitry. [*See, e.g.*, D.I. 67-1, Ex. B, 6:8–17; D.I. 67-1, Ex. C, 6:22–31; D.I. 67-1, Ex. D, 8:55–59; D.I. 67-1, Ex. E, 12:55–60.] From there, the Yang SR patents diverge at the margins, but the thrust of each is that the SR control circuit does not need to directly measure the output current in order to time the switching of the synchronous switch.

Thus the meaning of *in response to* is clear in the context of each specification and the many equations relating the circuit variables. The following discussion from the '298 patent exemplifies the point:

> $$T_{OFF} = K \times \frac{V_{DS} - V_O}{V_O} \times T_{ON} \qquad (16)$$
>
> Referring to equation (16) and the waveforms of the synchronous rectification circuit of FIG. 8, the period of the control signal S_W is controlled by the discharge time T_{OFF} of the capacitor 250 (the voltage V_C). The **<u>period</u>** of the control signal S_W **<u>is decreased</u>** *in response to* the **<u>decrease of the charge time</u>** T_{ON} of the capacitor 250. The **<u>period</u>** of the control signal S_W **<u>is increased</u>** *in response to* the **<u>decrease of the output voltage</u>** V_O. The charge time T_{ON} is controlled by the enable time of the switching signal S_{ON} which is correlated to the magnetization period (T_{CHARGE})."

[D.I. 67-1, Ex. B, 6:1–17; *see also* Figs. 7, 8.] The claimed circuit does not simply generate a control signal "in reaction to" the mere existence of some other signal as ON suggests. Rather, the period of the control signal is directly increased or decreased based on the actual magnitude of those other circuit parameters—here, the magnitude of the parameters shown in equation 16 corresponding to the "magnetized voltage," "demagnetized voltage" and "magnetization period."

Although ON has erased this teaching from the intrinsic record for purposes of its infringement contentions, in the co-pending IPRs ON has embraced the required relationship between the magnitude of the measured signal(s) and the signal generated in response. For example, in its Preliminary Response in IPR2018-00377 (re the ’705 patent), ON attempts to distinguish the prior art (*Zhou*) as failing to disclose a control signal generated *in response to* the magnetized and demagnetized voltage by relying on substantially the same construction PI advances here. [Ex. 5 (Patent Owner Resp.) at 26–27; *see also* Ex. 6 (Holberg Decl.) at 27–30.] ON contends that *Zhou*’s control signal, generated based on current I_1 and I_2 (representative of the magnetized and demagnetized voltages, respectively), is not generated in response to these voltages because “the values of I_1 and I_2 in *Zhou* are not responsive to **realtime values** of V_{IN} and Vo (*e.g.*, **values measured during operation**).” [Ex. 5 at 27; *see also* Ex. 6 at 29.] Setting aside the inaccuracy of ON’s characterization of the reference, ON acknowledges that a signal is generated *in response to* another variable only if that signal is derived from the measured value of the input signal.

A construction that does not include this necessary causal relationship between the measured (input) and generated (output) values would be overly broad and untethered from both the spirit of the claimed inventions and the specific operation of the disclosed embodiments.

2. “magnetized voltage” (’298 and ’705 patents)

There are two interrelated issues underlying the parties’ dispute as to the term “magnetized voltage” (and by natural extension, the term “demagnetized voltage”)—and both are driven by ON’s efforts in the co-pending IPR to avoid the prior art (again, *Zhou*). As best as PI can understand ON’s argument, it is that the claimed magnetized and demagnetized voltages can only be generated at a second winding distinct from the first winding in both the claimed “transformer” (in ’298 patent claims 1 and 2) and “magnetic device” (in ’298 patent claims 10

and 11 and all asserted ’705 patent claims). As such, according to ON’s argument in the IPR, a SR circuit having everything else in the claims but used in a “buck converter” topology (like *Zhou*) in not within the claims’ scope because it uses a single-winding inductor as the magnetic device responsible for storing and releasing energy to the output rather than a transformer. And because the inductor in *Zhou* is not comprised of two distinct windings (as in a transformer), ON asserts the claimed magnetized voltage and/or demagnetized voltage are absent. ON is wrong for at least two reasons: First, the claims are agnostic to whether there are distinct “primary” and “secondary” windings; the focus of the invention is on the charging and discharging of the energy transfer device and not on the windings. Second, the terms “magnetic device” and “transformer” are not interchangeable; importing limitations from the latter into the former, which is broader in scope, is improper.

As to the first issue, both parties agree that the term “magnetized voltage” (and similarly “demagnetized voltage”) has a particular meaning in the context of the ’298 and ’705 patents. And that meaning is apparent once it is understood that the operation of a switching power supply results in a cyclical storing and releasing of energy in a magnetic device (such as a transformer or inductor) positioned between the input and output sides of the circuit. The written description of both ’298 and ’705 patents specifically explains the magnetization period—the storing of energy—in the example embodiment as follows:

> A voltage V_E is applied to the primary winding N_P in response to the turning-on of the switch 15 during the magnetization period. Therefore, a charge current I_C is generated in accordance with the voltage V_E and inductance of the primary winding N_P. Meanwhile, a magnetized voltage V_S is produced at the secondary winding N_S.

[D.I. 67-1, Ex. B, 1:21–27; *see also* 2:66–3:4.] Thus, during the magnetization period, an input voltage is applied to the [magnetic device or transformer] and a concomitant voltage is produced

(this is the "magnetized voltage of the [magnetic device/transformer]").[4] Here the parties agree; it is the application of a voltage to the input that magnetizes the device and thus causes the magnetized voltage. The specifications goes on to explain the demagnetization period:

> Once the switch 15 is turned off, the energy of the transformer 10 is delivered to the output of the power converter through the secondary winding N_S and the power switch 20. A demagnetized voltage (the output voltage V_O) is thus applied to the secondary winding N_S during the demagnetization period.

[*Id.* at 1:27–32; *see also* 3:5–8.] Thus, during the demagnetization period, the main switch, and thus the input voltage, is cut off, resulting in the release of energy that was previously stored in the magnetic device, which is then delivered to the output of the power supply (this is the "demagnetized voltage"). This periodic magnetization and demagnetization of a "magnetic device" is at the core of how switching power supplies work and it is what determines the magnetized and demagnetized voltages.

ON's proposal that the magnetized voltage is the "voltage produced at a secondary winding **while an input voltage is applied to a primary winding**" whereas the demagnetized voltage is the "voltage applied to the secondary winding **while an input voltage is not applied to the primary winding**" is technically inaccurate and, in any event, focuses on details irrelevant to the claimed operation. When viewed in combination with its proposal for "demagnetized voltage," it becomes apparent that ON's intent is to create a limitation on the relationship between primary and secondary windings—a red herring—rather than on whether the magnetic device is in a state of charging (magnetizing) or discharging (demagnetizing). It may very well be true that, as ON suggests, in certain situations the demagnetization period corresponds with the period when an input voltage is not applied to the magnetic device, but that is not necessarily always the case. *Compare* Figure 2A (showing the demagnetization period can

[4] Note the claims speak in terms of the magnetized (and demagnetized) voltage "of the [magnetic

be over but the input voltage is not applied) with Figure 2B (showing those periods to be substantially coextensive). The focus for both terms should be, as the above-recited portion of the specification makes clear, the voltage at the output *when the magnetic device is magnetizing and when the magnetic device is demagnetizing*, not on the state of the primary (or any other particular) winding.

As to the second issue, the terms "magnetic device" and "transformer" are not interchangeable. [*See* D.I. 67-1, Ex. B, 1:14 ("A magnetic device **such as** a transformer…").] Thus, ON's attempts to import a characteristic of a transformer into the terms "magnetized voltage" and "demagnetized voltage"—*i.e.* requiring distinct first and second windings—is improper, regardless whether the claim recites a transformer or the broader "magnetic device". Indeed, the '298 patent includes claims reciting a "transformer" (claims 1 and 2) as well as parallel claims reciting a "magnetic device" (claims 11 and 12), which further supports the distinctness of the terms. *See Karlin Tech., Inc. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 971–72 (Fed. Cir. 1999) (explaining "the common sense notion that different words or phrases used in separate claims are presumed to indicate that the claims have different meanings and scope"). In addition, independent claim 1 of the '705 patent recites "a magnetic device," whereas dependent claim 11 adds "wherein the magnetic device is a transformer." [D.I. 67-1, Ex. C, 8:20–21.] The clear implication is that "magnetic device" is not limited to a transformer. *See InterDigital*, 690 F.3d at 1324–25; *see also Phillips v. AWH Corp.*, 415 F.3d 1302, 1315 (Fed. Cir. 2005) (en banc) ("the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim"). ON's

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device/transformer]", not of a "winding."

attempts to inject limitations relevant only to a transformer into the terms magnetized and demagnetized voltage should be rejected.

3. "polarity of the pulse signal(s)" ('923 and '407 patents)

The term "polarity" has a commonly understood meaning, unequivocally adopted by the '923 and '407 patents. Unlike a generic "pulse" signal that may have a high and low state, the additional polarity qualifier means the claimed pulse signals have both positive and negative magnitudes relative to a common reference. ON's proposal, tracking the characteristics of a pulse signal generally, would nullify the inclusion of the term "polarity" in the claims.

Starting from the claim language, which is the single most important source of intrinsic evidence, *Vitronics Corp. v. Conceptronic, Inc.,* 90 F.3d 1576, 1582 (Fed. Cir. 1996), it is clear that the "polarity" of the pulse signal is a requirement of the purported inventions. Claim 1 of the '923 patent recites "a polarity of said pulse signals determines on or off states of said power-switch set," and claim 1 of the '407 patent similarly recites "the polarity of the pulse signal determines the on/off of the power switch." [D.I. 67-1, Ex. D, 9:19–20; Ex. E, 13:26–28.] And '923 patent claim 12 recites "setting or resetting said latch in response to the polarity of said pulse signals," whereas '407 patent claim 31 recites "setting or resetting the latch circuit in response to the polarity of the pulse signal." [D.I. 67-1, Ex. E, 10:55–56; Ex. E, 17:4–5.] In each case, the "pulse signal" alone does not dictate the on/off state of the switch or the setting/resetting of the latch but rather, it is *the polarity* of the signal that is tied to the action.

Pulse signals are ubiquitous in control circuitry and the term has a commonly understood definition that includes any signal that temporarily changes in amplitude from and returns to a baseline value. [*See, e.g.*, Section IV.B.1 (dictionary definitions).] Thus, a generic pulse signal by definition is either in a high or low state. Had the patentee intended to convey only that the high or low state of the pulse signal determined the state of the switch or latch, respectively, as

ON proposes, no further claim language would have been necessary. ON's proposal, therefore, renders "polarity" superfluous.

The '923 and '407 patents both explain the significance of the polarity requirement, by distinguishing between a signal having polarity as compared to a signal having only a baseline (low) and high state. In the '923 patent, pulse-signal generator 270, shown in Figure 2, generates pulse signals X_P and X_N, which in turn generate pulse signal S_P and S_N. [D.I. 67-1, Ex. D, 3:44–45, 53–54; Fig. 2.] The specification goes on to explain that these are "differential signals." [*Id.* at 3:51, 57; 4:14–15.] As a consequence of being differential in nature, the claimed pulse signals have both positive and negative polarity; "A **positive-polarity** pulse signals X_P and X_N is generated in response to the rising edge of the PWM signal V_{PWM}. A **negative-polarity** pulse signals X_P and X_N is generated in response to the falling edge of the PWM signal V_{PWM} and the oscillation signal RPS." [*Id.* at 4:14–18.] This positive-to-negative swing requirement is also borne out in the figures:

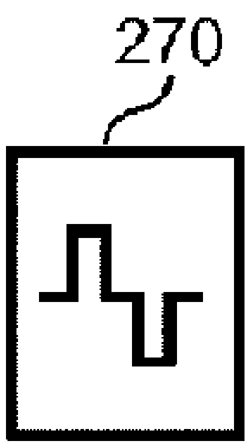

FIG. 2

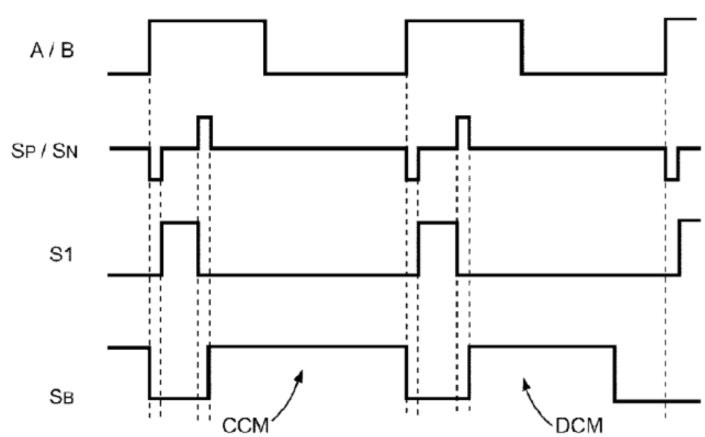

FIG. 14

[*Id.* at Fig. 2 (excerpted); Fig. 14.] The representation of pulse-signal generator 270 from Figure 2 plainly shows a signal having both positive and negative amplitude relative to a common reference. This differential nature is also seen in the waveform of pulse signals S_P/S_N in Figure

14, in contrast to the other signals shown having an amplitude only in one direction. The '407 patent disclosure is the same on this point. [*See* D.I. 67-1, Ex. E, 5:26–30, Figs. 2 and 17.]

While the intrinsic evidence is dispositive, the extrinsic evidence is also in accord. [*See* Ex. 3 (MODERN DICTIONARY OF ELECTRONICS), 575) ("polarity"—"1. A condition by which the **direction of current** can be determined in an electrical circuit (usually batteries and other direct-voltage sources). 2. Having two **opposite charges**, **one positive and one negative**. 3. Having **two opposite magnetic poles**, one north and the other south. 4. The **condition of positiveness or negativeness** in an electrical circuit. 5. The **positive and negative orientation** of a signal or power source. 6. Any condition in which there are **two opposing voltage levels or charges, such as positive and negative**.").] Thus, it is the characteristic of having both a positive and negative amplitude—and not merely a shift in amplitude from high to low—that defines polarity. This characteristic must be a part of any proper construction and, therefore, PI's proposed construction should be adopted.

4. "power-switch set" ('923 patent)

Through its proposed construction, ON is attempting to broaden the '923 patent's claimed circuit configuration employing a power-switch ***set*** to read on a circuit having a single transistor switch. Although the plain import of the term, in light of the specification's clear disclosure, requires two or more transistors configured to operate collectively as a power switch, ON's infringement read is predicated on excising this limitation from the claim.

Figure 9 from the '923 patent's specification (and the supporting disclosure) illustrates the fundamental problem with ON's overbroad construction. [D.I. 67-1, Ex. D, Fig. 9.] Referring to Figure 9, the specification explains: "The power-switch set 371 includes power **switches** 300, 310, and diodes 350, 360. . . . Power **switches** 300 and 310 are connected in series and back-to-back. Power **switches** 300 and 310 are further connected between the terminal K

and the terminal G of the synchronous switch 50." [*Id.* at 5:57–65.] In other words, while the power-switch set may comprise a collection of circuit elements configured to operate as a switch, as ON suggests, it necessarily also requires at least two transistor devices, *e.g.*, "power **switches** 300, 301." Indeed, it is the combined operation of both transistors or switches within the power-switch set that permits the circuit to operate as claimed. [*See id.* at 5:55–7:6; Fig. 9.] There is nothing in the specification that contemplates a "power-switch set" having only a single transistor. If this was the intent, the claim would not have used the term "set" to modify "power switch." ON's construction, therefore, is vague, inconsistent with the intrinsic record and should be rejected.

B. The '258 patent – Yang synchronous rectification + cable compensation

The '258 patent purports to describe a regulation circuit that can compensate for the voltage drop across an output cable of the power supply. [D.I. 67-1, Ex. F, at 1:58–2:15.] As is well known in the art, the output cable has a resistive voltage drop proportional to the output current flowing through it. [*Id.* at 1:46–47.] The term "cable compensation" refers to compensating for this voltage drop by providing a proportionally higher output voltage at the power supply so that a targeted regulated output voltage is seen by the load—at the downstream end of the cable. [*Id.* at 1:47–49.] The '258 patent acknowledges that the output current can be sensed directly using a shunt resistor but contends that this prior art approach is inefficient. [*Id.* at 1:46–54.] Picking up where the previously discussed Yang SR patents left off,[5] the '258 patent contends that rather than sensing the output current, the synchronous rectification signal can be used instead—based on the purported correlation between the output current and the synchronous rectification signal. [*Id.* at 1:58–62, 3:45–48.]

[5] The '258 patent incorporates by reference the '298 patent regarding generating the synchronous rectification signal.

1. "generating a compensation signal in accordance with a synchronous rectifying signal"

The parties' dispute with respect to "in accordance with" tracks the "in response to" dispute. As with the related signals discussed above, the value of the '258 patent's compensation signal is likewise derived, at least in part, from the measured value (in this case the duration of the on-time) of the synchronous rectification signal. ON's proposal fails to account for the causal and calculable relationship between the SR control signal and the compensation signal. Rather, it incorrectly suggests that the limitation is satisfied even if some coincidental *post hac* relationship exists.

The relationship between the magnitude of the SR signal (specifically its duration) and the value of the compensation signal is plainly explained in the specification. First, there is a direct causal relationship between the level of output current and the voltage drop that underscores the purpose of the invention; the larger the output current (I_O), the more voltage drop will occur between the sensed output voltage (V_A), and the actual output voltage at the load (V_O). [*Id.* at 1:46–47.] The patent also claims, based on the manner in which the signal is generated, that there is a direct relationship between the SR signal (S_{SR}) and the output current (I_O). [*Id.* at 3:10–45 (relying, in part, on the incorporation by reference of the Yang '298 patent).] Thus, the Yang '258 patent asserts "the SR signal S_{SR} can be used instead of the output current I_O to control the output voltage V_O for the cable compensation." [*Id.* at 3:45–48.]

The patent discloses receiving the SR signal and using its pulse width to generate a current, I_{COMP}, proportional to how long the SR signal is high. [*See id.* at 4:42–5:21, Fig. 4.] From there, the '258 patent purports to perform cable compensation according to known principals. The measured voltage V_A is compensated using I_{COMP} which was derived directly

from the SR signal (S_{SR})—acting as a proxy for the actual output current—and the corrected V_A is fed into the circuit's feedback loop. [*Id.* at 3:49–60.]

The compensation works, according to the specification, because of the mathematical relationship between the output current and the synchronous rectification signal: "the compensation signal I_{COMP} can program and compensate the reference signal V_{REF}, and the reference signal V_{REF} is programmable in response to the output current I_O (as shown in Fig. 2) due to the compensation signal I_{COMP} is correlated to the SR signal S_{SR} and the SR signal S_{SR} is correlated to the output current I_O." [*Id.* at 4:23–28.] The compensation signal can represent the output current only because it is derived directly from the SR signal, which is what "in accordance with" means. There is no teaching in the specification of a "compensation signal" that is created independently of the synchronous rectification signal, but that just happens to share some coincidental "conformance" as opposed to an intended, causal, relationship. More particularly, it would be unreasonable to construe the claim to cover a compensation signal which is generated by directly sensing the output current – rather than using the SR control signal—because the patent expressly wants to avoid sensing the output current. [*See id.* at 1:46–54.] A compensation signal generated from the sensed output current could, however, be argued to "conform with" a synchronous rectification signal that itself, independently, varies with changing output current. ON's proposal, therefore, would allow the claim to be read on exactly what the patent says it wants to avoid, and as such should be rejected.

2. "error amplifier"

The parties dispute whether an "error amplifier" must generate an analog output signal having a magnitude that is representative of the actual difference between two input signals or, in contrast, whether the output can simply indicate whether any difference exists between the inputs. While it may appear the parties' constructions are in accord, the key point of distinction

is that, as PI proposes, the claimed error amplifier must generate an analog output signal *having a magnitude proportional to the difference* between the two input signals. ON's proposed construction incorrectly suggests that an error amplifier generates an output signal merely indicating whether a difference exists between input signals. ON's preliminary infringement contentions point to a comparator (which generates a binary output indicative of whether one input is higher than the other) in the accused products and not an "error amplifier." Thus, it appears that ON intends to argue that the claim term "error amplifier" encompasses a comparator. ON's proposal, however, is contrary to both the written description and the basic operation of the claimed invention.

The intrinsic record demonstrates that the claimed "error amplifier" generates an analog output signal that represents the amount of the difference between the measured voltage and a desired voltage, and not merely a logic output that indicates there is some difference between the two signals (*e.g.*, that one is greater than the other). In analog feedback circuits, such as in the '258 patent, error signals are used to make feedback-based adjustments to correct the "error" between a desired output and an actual output. In this regard, an error signal represents the error, or the amount of difference, between two signals, so the system knows not only whether to adjust but by how much. [*See, e.g.,* Ex. 4 (IEEE DICTIONARY) at 395 ("In a control system the error signal is the difference between a sensing signal and a constant reference signal.").] This type of feedback is illustrated plainly in Figure 3. Indeed, the very purpose of the error signal generated by the error amplifier 170 is to represent the disparity between the actual and target output voltage. [*See* D.I. 67-1, Ex. F, 3:49–60, 4:33–41.] Thus the specification forecloses ON's overbroad read and PI's proposal should be adopted.

C. The Sanyo ’211 patent

1. common leads projecting out from the resin-sealing body

The ’211 patent makes clear that common leads are physically separate structures. For example, the claims require a “plurality” of common leads, with a “coupling portion” joining them. ’211 patent, claims 1, 5. Dependent claims 2 and 6 likewise require the plurality of common leads also be “bridged” by a conductive adhesive. [*See* D.I. 67-1, Ex. G, Fig. 4; 4:13–16, 6:18–21.] This cannot happen if the common leads are not physically separate.

The specification likewise describes only physically separate common leads. [*Id.*, 3:13–27 (describing common leads “spaced at predetermined intervals” and “arranged adjacently to one another in the center of arrays of leads”); 5:6-15; *see also id.*, Figs. 1–4, 5B, 6B, 7, 9–10; D.I.67-1, Ex. P at 851 (’211 patent application, Fig. 8)]; *Profectus Tech. LLC v. Huawei Techs. Co.*, 823 F.3d 1375, 1381 (Fed. Cir. 2016) (affirming construction that required a “feature for mounting” where “[i]n every embodiment disclosed in the specification, the picture display or frame includes a feature for mounting”).] The specification thus confirms what is revealed by the claim structure.

ON fights against requiring physically separate common leads because it is asserting the ’211 patent against products with a single lead. [*See, e.g.*, Ex. 7 (excerpts from ON’s Infringement Contentions) at 28–29.] It is unclear how anyone can determine whether a structure constitutes a “plurality” of leads if “common leads” are not construed to be physically separate. *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1257 (Fed. Cir. 2010) (“Claims must be ‘interpreted with an eye toward giving effect to all terms in the claim.’”) (citation omitted).

ON’s attempt to require the plurality of common leads to begin inside the claimed device is not designed to explain what is meant by the claims and is, instead, an improper attempt to

import an extraneous limitation into the claims. *See*, *e.g.*, *DSW, Inc. v. Shoe Pavilion, Inc.*, 537 F.3d 1342, 1347 (Fed. Cir. 2008) ("[T]his court has consistently adhered to the proposition . . . that interpreting what is *meant* by a word *in* a claim is not to be confused with adding an extraneous limitation appearing in the specification, which is improper.") (emphasis in original) (quotation marks and citation omitted); *Kapusta v. Gale Corp.*, 155 F. App'x 518, 520–23 (Fed. Cir. 2005) (holding that "the district court erred in its claim construction by including [an] extraneous limitation[]" where "the specification never suggests that [the limitation] is critical to the operation of the invention" and never "assign[s] any significance to the [limitation]"). Moreover, ON's proposed construction excludes devices in which the claimed island extends to the edge of the resin-sealing body before splitting into common leads, as well as devices in which the coupling portion appears *inside* the resin sealing body. Nothing in the '211 patent precludes such embodiments, and ON can offer no justification for doing so.

2. hybrid integrated circuit board

The intrinsic record demonstrates PI's construction is correct. First, the structure of the claims confirms that a hybrid integrated circuit board is formed separately from the conductive pattern. [D.I. 67-1, Ex. G, claim 5 (requiring "a conductive pattern <u>formed</u> at least <u>on</u> a surface of a hybrid integrated circuit board") (emphasis added).] "Where a claim lists elements separately, 'the clear implication of the claim language' is that those elements are 'distinct component[s]' of the patented invention." *Becton*, 616 F.3d at 1254 (citation omitted). The specification confirms this characteristic of the structure. [*See*, *e.g.*, D.I. 67-1, Ex. G, Fig. 5B (showing the conductive pattern (43a) formed on the board (41)); 5:55–65 (contrasting the heat dissipation properties of a hybrid integrated circuit board and a lead frame).]

Second, the '211 patent discloses that either a nonconductive board may be used, [*id.*, 4:47–51], or a conductive board with a "surface . . . coated with insulating resin." [*Id.*, 4:37–46,

4:52–56, 5:4–5, 5:20–24.] The specification refers to this insulating layer as the surface of the hybrid integrated circuit board. [*Id.*, Fig. 6A (no. 58), 5:33–42; *see also* Fig. 5B, 4:34–36, 5:4–5.] A nonconductive board or insulating layer is required so that the conductive pattern can be formed on it. [*Id.*, 4:52–5:5, 5:20–24.][6]

ON's proposed construction is wrong for several reasons. First, its proposal is designed to allow it to argue that a conductive pattern *is* the hybrid integrated circuit board. [*See* Ex. 7 at 21.] Due to the structural requirements of the claims discussed above this cannot be correct. Second, the phrase "interconnect structure" gives no meaningful guidance as what structures do or do not satisfy this element, and ON cannot show that it would be understandable to a jury. *See Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1050 (Fed. Cir. 2016) ("[T]he aim of claim construction [is] to give the finder of fact an understandable interpretation of claim scope to apply to the accused systems."). Third, the "hybrid integrated circuit board" in the patent does not transmit signals or "interconnect . . . electronic elements"; that is the job of the *conductive pattern*. [D.I. 67-1, Ex. G, 4:55–5:5, 5:49–54 (referring the board absent a conductive pattern as "dead space").] Last, requiring the board to support "a plurality of electronic elements" is directly contrary to the language of the claims. Claim 5 requires only one electronic element, *e.g.*, "a semiconductor element or a passive element," not both and not multiple of either. [*Id.*, 7:34–35.]

VI. CONCLUSION

For the reasons stated above, the Court should adopt Power Integrations' proposed constructions of the disputed claim terms.

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6 The word "board" has a plain meaning and needs no construction. That plain meaning comports with how "board" is used in the '211 patent.

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